

THE PAPERLESS MBA

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The paradox is blatant and astonishing. Students have enrolled in an MBA program that offers a specialization in Sustainability and on the first day of class, requires you to purchase a 500-page binder of notes. In total, the program will consume over 111 trees.

As universities become more sensitive to their impact on the environment, change is certain, however the magnitude and speed with which the change will occur comes into question.

At the University of British Columbia change is in the air but a severe gap exists between front office policy and end user execution.

UBC Mandate

In 1990 UBC signed the Talloires Declaration (TD), a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities.¹

This was followed in 2007 by President Toope's mandate that the university be carbon neutral by 2010. As action steps towards this goal, the university established a sustainability office, which is charged with establishing sustainable initiatives for the university. They report their findings in an annual report on sustainability.

¹ ULSF – The Association of University Leaders For a Sustainable Future

Sustainability Report

To date the Talloires declaration has been signed by over 350 university presidents and chancellors in over 40 countries². The signing of this declaration shows that UBC has an ongoing commitment to sustainability, and they set 68 goals to be accomplished in a 5-year plan (2006-2010)³. These goals lie within the social economic and environmental sectors and the University and the achievements are summarized as follows :

Social

Health, Well-Being and Community

The University has made a dramatic effort to reduce the frequency of time-loss accidents by promoting awareness of campus security for students as well as employing a detailed safety management system for employees. They also have a goal to create a campus where students are no longer dependant on cars in order to obtain an education. This includes plans to design more appropriate and increasing levels of campus accommodations that use sustainable building practices.

Sustainable Purchasing

Because UBC is such a large purchaser of food, they have the purchasing power to affect suppliers and their sourcing decisions. They have sourced Pura Vida coffee, which is 100% organic, as the house brand for all non-franchise venues on campus⁴. They have also attempted to modify food purchasing to ensure that all food

² UBC sustainability Report 2006-2007 – Page 15

³ UBC sustainability Report 2006-2007 – Page 4

⁴ UBC sustainability Report 2006-2007 – Page 6

purchasing is done from companies that harvest sustainably, feature environmentally preferable packaging, raise animals humanely, and are local.

Economic

Economic Viability

The University is trying to maintain its role as a world leading research institution. They have been attempting to grow their research funding, attract highly competent research staff, and are developing the \$36.1 million Centre for Interactive Research in Sustainability (CIRS) and the \$11 million Clean Energy Research Centre (CERC). This has been done in addition to growing their endowment fund to \$1.01 billion⁵.

Responsible Management of Public Infrastructure

This area has been one of the most important goals for the school, as they have realized tremendous savings. Because nearly 255 buildings on the Vancouver campus are more than 30 years old, UBC Renew was launched in 2002 to renovate the buildings instead of rebuilding them. The benefits that the school has realized through this project have been substantial because of more efficient completion times, the preservation of cultural and heritage values, and cost savings which have resulted in every third building being free⁶.

⁵ UBC sustainability Report 2006-2007 – Page 7

⁶ UBC sustainability Report 2006-2007 – Page 7

Environmental

UBC has made substantial improvements in terms of their environmental footprint, and they proudly display the results of their efforts on the UBC sustainability homepage, www.sustain.ubc.ca. As of the date of this paper, UBC has saved⁷ :

- 210,946,081 sheets of virgin copy/printing paper
- 210,481,191 kWh of electricity
- 26,643,701,000 litres of water
- 84,362 tons of GHG emissions
- \$36,107,577

These numbers are substantial, and show that some of the metrics that the university is instituting are working. They primarily focus on the following areas:

Pollution Reduction

The University has been looking at a number of different ways to reduce the amount of pollution produced. This includes the introduction of the U-Pass, which has increased transit ridership by over 50%⁸, as well as the conversion of 3% of university vehicles to Super Low Emission Vehicles (SULEV). They have also realized a reduction in pollution through the retrofitting of older boilers, the reduction of waste, and more effective storm water management.

Conserve Resources

In this section, the Sustainability Report addresses the reduction in consumption of energy, the reduction of water usage, and the reduction of paper usage. The fact

⁷ <http://www.sustain.ubc.ca/> (homepage) – estimated savings since April 1,1999

⁸ UBC sustainability Report 2006-2007 – Page 40

that the paper issue is addressed within this report shows that UBC has already considered this to be a major issue within the university. They claim that the overall usage of paper has been reduced by 27% whereas there has been an increase in students by close to 30%⁹, and that they have already reduced their per capita paper consumption by 41%, their 2010 target. They have achieved this by introducing a paperless academic office (Faculty of Land & Food), coupled with the introduction of e-textbooks by the UBC bookstore in 2007.

Although the issue of paper is addressed within the entire report, it is only addressed in a minor way. While the introduction of one paperless administration office and the availability of a few e-textbooks is a step in the right direction, there is much more that the university can and should do to reduce paper usage.

Government Legislation

The BC government is, by far, the country's forerunner on green legislation. In 2007 the BC government legislated the BC Climate Action Secretariat. This legislation mandates that all public offices, including universities, be carbon neutral by 2010. The goal is to have net zero greenhouse gas emissions by 2010. The reductions mandated under this legislation include the scope of buildings, fleet, travel and procurement. Interestingly enough, paper usage is the only factor currently being measured under the procurement reduction initiative.

Universities must measure GHG emissions in line with international standards:

- Establish plans, tools and policies
- Take Action

⁹ UBC sustainability Report 2006-2007 – Page 42

- Publicly report
- Offset emissions not reduced

The University is required to engage the public and educate them. The end result is the hope that people will change their behavior based on this new information.

UBC To Date

UBC has been a forerunner in initiatives towards net zero from an administrative perspective, leading the way in benchmarking, monitoring and reducing their outputs. At a front office level, the university is meeting the mandates that they have committed to; however there is a lack of awareness at the faculty and student level. In a survey of MBA students more than 70%¹⁰ stated that they were not aware of the university or government mandates towards carbon neutrality and 78%¹¹ stated that they did not feel that the University and MBA program are initiating sustainable practices.

The fact of the matter is that while the University is achieving top line goals it has neglected to educate both students and faculty on these initiatives or to define the jurisdiction of these mandates.

Victoria Wakefield, Manager of Logistics and Sustainability for the University reports that based on the UBC benchmark, 2007, 75 million sheets of paper are used in operations. This equates to 402.2 tons of paper and 1091.3 tons of CO₂. At the standard offset cost of \$25/ton, this would leave the university with a \$27,282.50 offset liability if no action were taken to move towards a paperless university.

¹⁰ 2009 MBA Paper Usage Study, Forrest, Kaida and Raviraj

¹¹ 2009 MBA Paper Usage Study, Forrest, Kaida and Raviraj

The scope of this paper consumption focuses on university administration and operations and does not include consumption by individual faculties, professors or students. Wakefield predicts that this could be 10 to 20 times more. If the jurisdiction of the university and government mandates were to be expanded to these groups, the university would be responsible for offsets in the range of \$270,000 to \$540,000.

Prof Marty Weitzman, Harvard School of Economics, has even argued that the social cost of CO₂ should be estimated at \$50/ton¹². This estimation would imply a social cost of over \$1,000,000 for the University.

The Paper Problem

Based on these staggering figures a massive gap exists between current consumption and university objectives. To look at the holistic problem may be difficult, but if we can consider one program and the changes that can be made, there are grassroot opportunities for us to make a difference.

To consider a paperless MBA is idealistic but there are significant steps that can be taken to reduce the overall environmental impact of the MBA program. To understand the opportunity we must first understand the current state of the MBA.

The following table represents our estimates of paper consumption for the complete 15-month MBA program at UBC. For ease of calculation we have assumed equivalent paper types for all categories and applied this consumption to three possible paper types.

¹² Fifty Dollars Per Ton of Carbon Dioxide, Daniel Hall, April 2, 2008

UBC MBA - Average Paper Consumption				
Students	Sheets per course/student	Sheets per period(4 courses)/student	Sheets for the entire course 5 periods/student	Paper Consumed by 116 students in the program
Texts	220	880	5,280	580,800
Course Package	90	360	2,160	237,600
Core Binder	200			22,000
Class Hand outs	40	160	960	105,600
Assignment	15	60	300	33,000
Evaluation Forms		4	20	2,200
E-mail Print outs	10	40	240	26,400
Rough Sheets	25	100	600	66,000
Total	600	1,604	9,560	1,073,600
BCC and MBA Office				
	Sheets/person/day*	Sheets/person/year (235 working days)	Sheets used by the MBA office and BCC for the year (Approx 30 members)	
Administrative purpose	15	3,525	105,750	
Circulation materials and memo	14	3,290	98,700	
Rough Sheets	6	1,410	42,300	
Total	35	8,225	246,750	
Overall Sheet Consumption/Year	1,320,350	# of trees required	111	

Resource: <http://www.printgreener.com/earthday.html#citation>:<http://www.printgreener.com/earthday.html#citation1>

Table 1. Paper consumption for all the 15 month MBA program (total)

The UBC MBA program has approximately 116 students / year. The students use a mix of texts, course packages, class slides and rough notes to study and prepare for classes. Paper is habitually incorporated into all aspects of the program. Students are unaware of the process of paper manufacturing, the energy wasted, the solid emissions and the global warming caused by the paper industry. Nearly 50% of the trees harvested in North America are used to make paper products and this figure is expected to increase to 77% by 2020¹³.

In total, over 1.3 million sheets are used in the completion of one average MBA class (see Table 1), which is the equivalent of more than 9,500 sheets per person. In order to meet this paper demand, 111¹⁴ trees are required. As astonishing as this

¹³ Ancient Forest Friendly Paper, Greenpeace International

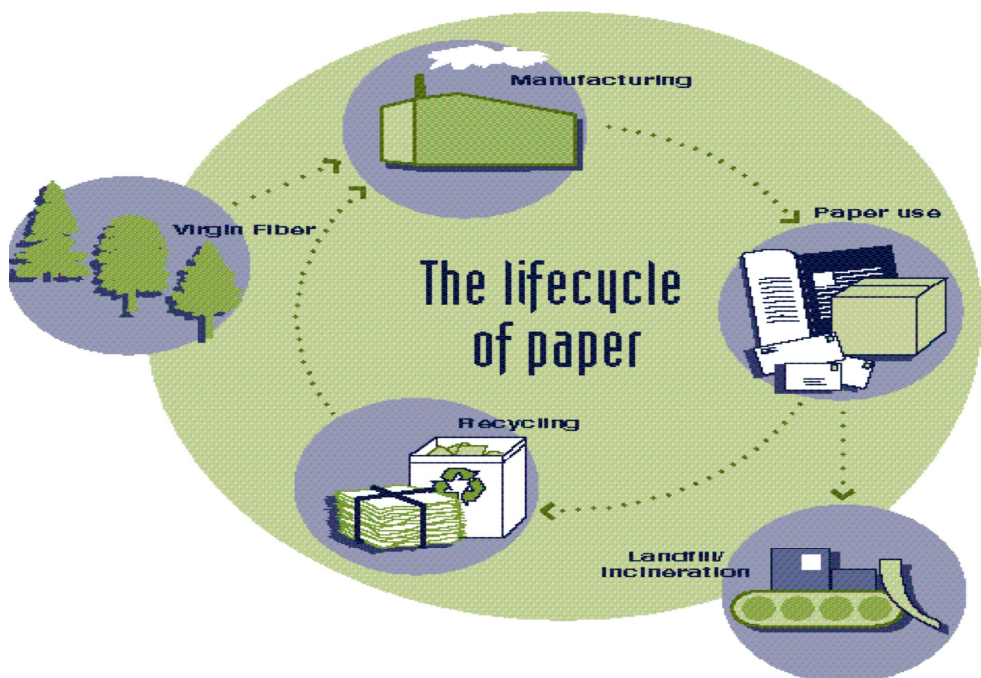
¹⁴ Environmental Defense Fund – Paper Calculator

figure is, there are many other environmental impacts associated with the use of paper.

Environmental Impact

In order to accurately assess the environmental impact of paper, some background analysis needs to be done on the production of paper, and the different steps required in order to produce the reams upon reams that we consume at the university every day. Figure 1 shows the brief overview of the life cycle of paper¹⁵, which starts in the forest and ends in a landfill or incinerator. The steps are detailed below.

Figure 1. The Life –Cycle of Paper



(Source : Prepared by the Centre for Design at RMIT University)

¹⁵ What is the life cycle of paper” poster teachers resource 2008 Prepared by the Centre for Design at RMIT University

Sourcing

The paper life-cycle begins with the harvesting of raw materials, which includes cutting down trees to get the wood to make fibers, and the collection of salt in order to make the chlorine bleach. In British Columbia, over 40% of the trees cut are used to make paper¹⁶. These trees are typically the Douglas Fir, the Black, White or Sitka Spruce, or the Western Hemlock¹⁷. The logging industry for paper has gone through tremendous environmental scrutiny over the years, however organizations such as the Forest Stewardship Council (FSC) are promoting paper where the wood has been harvested from an environmentally and socially responsible source. The wood is then sent to the manufacturing stage for processing.

Manufacturing

The wood is sent to a factory where it is debarked and turned into little wood chips, which can be turned into pulp either chemically or mechanically and bleach is added to make the pulp white. This pulp is placed onto a wire screen and squeezed between rollers to remove excess water. The paper is then wound onto large rollers and cut into smaller, more manageable sheets¹⁸.

Packaging Transport and Use

Once the paper is cut, it must be transported to the end user, normally by truck. The paper is then used in a variety of ways, as there are more than 7,000 different

¹⁶ <http://www.environmentalpaper.org/PAPER-statistics.html>

¹⁷ <http://www.paper.org.uk/information/factsheets/trees.pdf>

¹⁸ What is the life cycle of paper” poster teachers resource 2008 Prepared by the Centre for Design at RMIT University – page 4

types¹⁹. However, there are six main types of paper : newsprint, printing and writing paper, case-making materials, packaging papers and boards, household and toilet tissues, and industrial and special purpose paper²⁰.

End of Life

Once the paper has been used, it can either be reused, recycled, or sent to the landfill. Once sent to the landfill, the paper can either be incinerated or it sits in the landfill for years and years. Paper is the largest component of municipal solid waste, and it is said that more than 40% of landfills are made up of paper or paper based products²¹. Incineration is a way of eliminating the space taken up by paper, and some energy can be generated from the process, however harmful air pollution is released during the incineration process.

Recycling vs One Use

Figure 2 shows a diagram of the difference between one use and recycled paper. While paper can only be recycled approximately 5 times, because the fibers start to break and weaken, it is said that for each ton of paper recycled, you realize the following savings²² :

- 13 trees

¹⁹ What is the life cycle of paper” poster teachers resource 2008 Prepared by the Centre for Design at RMIT University – page 6

²⁰ What is the life cycle of paper” poster teachers resource 2008 Prepared by the Centre for Design at RMIT University – page 4

²¹ U.S. Environmental Protection Agency. Retrieved on 2007-04-28

²² What is the life cycle of paper” poster teachers resource 2008 Prepared by the Centre for Design at RMIT University – page 8

- 2.5 barrels of oil
- 4100 kWh of electricity
- 4 cubic meters of landfill
- 31,780 liters of water
- 1.4 tonnes of CO₂ equivalent (when compared to landfill)²³

Most of the above statistics vary depending on the source, and the actual environmental benefit of recycling is often contested. Nevertheless, the EPA has said that the recycling of paper causes 35% less water pollution and 74% less air pollution²⁴. What is normally not included in the rationale for recycling is the idea that the recycled paper needs to be sorted, contaminated paper needs to be eliminated, the paper needs to be deinked either chemically or mechanically, and that the recyclable paper needs to be returned to the paper mills where it is mixed in with virgin wood to create new paper. Although this may reduce water and air pollution overall, there is still a substantial amount of energy and waste involved in the recycling process. There is a strong argument for reducing paper use overall as

²³ http://www.paper.org.uk/information/factsheets/greenhouse_gas.pdf

²⁴ "Recycle on the Go: Basic Information". October 18, 2007. Retrieved on 2007-10-3

opposed to recycling at current usage.

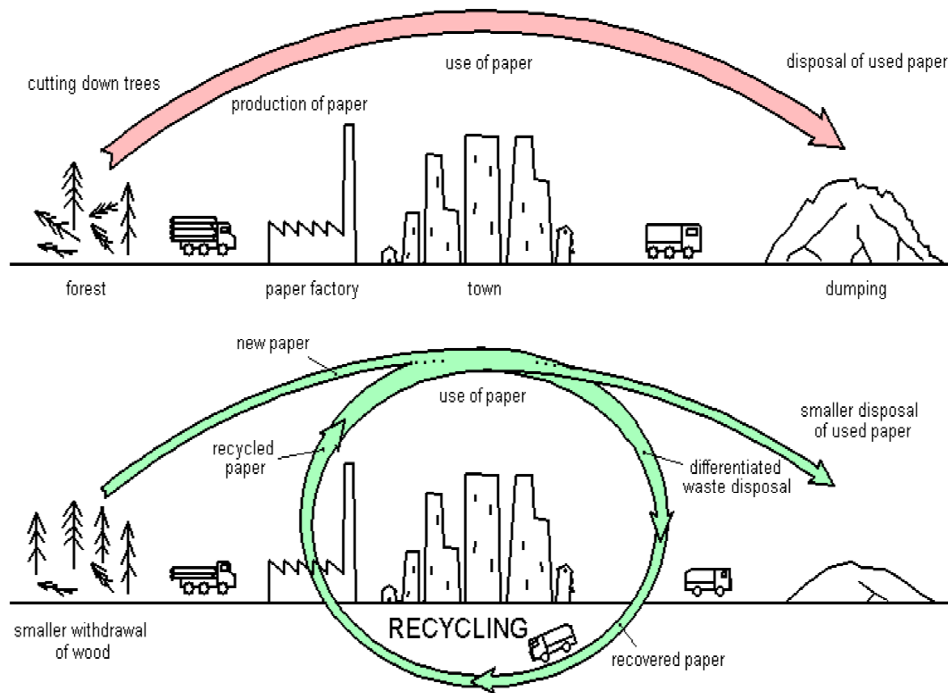


Figure 2. Recycling Vs. One Use

(Source : What is the life cycle of paper” poster teachers resource 2008 Prepared by the Centre for Design at RMIT University – page 4)

Environmental Impact

The paper making process is very energy-intensive, as a substantial amount is used for the transport of paper, as well as during the manufacturing process. In addition to this, the paper making process uses a large amount of water, toxic chemicals such as bleach and chlorine, and releases air pollution and greenhouse gases during manufacturing. In “Business Guide to Paper Reduction”, Heather Sarantis argues that paper over-use harms the natural forest environment in many ways due to deforestation, where there is a loss of habitat and species endangerment, and also

because of erosion issues and water and air pollution.²⁵ As well, she argues, pulp and paper mills produce about 245,000 metric tons of toxic air pollutants per year, including VOC's, sulfur, dioxins and other toxins with associated health risks²⁶. The pulp and paper industry is the fifth largest industrial consumer of energy, and accounts for 4% of the world's energy use²⁷. Most of this energy is still produced using conventional fossil fuels, another major cause of greenhouse gas emissions and air pollutants. It is also said that producing one ton of paper uses 98 tons of different resources²⁸.

Finally, Sorantis argues that paper negatively impacts the environment further during its disposal, where toxic printing inks can leach into groundwater and the paper decomposes to form methane while sitting in a landfill²⁹.

Clearly the paper making process is harmful to the environment, and with its associated storage, production, printing, handling and transport costs, there is a place where the business and environmental sides intersect. That is, by reducing the usage of paper, you can benefit through the reduced cost to the university, while also decreasing the negative environmental impact of paper.

²⁵ Business Guide to Paper Reduction, Heather Sarantis, Environmental, Health and Social Justice Advocate, September 2002

²⁶ EPA Factsheet: "The Pulp and Paper Industry, the Pulping Process, and Pollutant Releases to the Environment."

²⁷ Cited from World Energy Council 1995

²⁸ Lovins, 50. Cited from Liedtke, C. "Material Intensity of Paper and Board Production in Western Europe," *Fresenius Environmental Bulletin*, August, 1993.

²⁹ Business Guide to Paper Reduction, Heather Sarantis, September 2002 – page 5

The university has gone to great lengths to reduce paper usage, as demonstrated through their statistics on the www.sustain.ubc.ca webpage, however more can be done in this area.

Environmental Impact of one MBA Class

Table 2 highlights some of the environmental impact that one class of 116 MBA students causes during the course of their 15-month program.

	Regular Copy Paper with 30% Recycled	
	Quantity of paper consumed/person	Quantity of paper consumed by all students
Paper Use (Tons)	0.09	6.6
Paper Use In (Kgs)	90	6600
Wood Use (Tons)	< 1ton	16
Total energy (BTUs)	3 million	220 million
Greenhouse gases (Co2 Equiv) in Lbs	455	33,381
Waste water (Gallons)	1,481	108,571
Solid waste (Lbs)	175	12,812

Source: [Environmental Defence Fund - Paper Calculator](#)

Table 2 – Impacts of the UBC MBA Program

The average UBC MBA program uses over 6.6 tons of paper. In order to produce this paper, 16 tons of wood material is required, which is over 111 trees. In total, 220 million BTUs of energy are required. The wastewater from production is 108,571 gallons, and the solid waste is 12,812 lbs.

Although these figures are not overwhelming on an individual basis, consider that this is the consumption of one class of 116. There are over 40,000 students attending UBC and the faculty consumption still has not been included in the calculation.

If we were to assume that this usage is similar across all programs, the results are staggering on a per annum basis. Over 2,762 tons/yr of wood materials required, a total of 19,118 trees/yr. This is equivalent to the electricity required to power 417 homes/yr. 28 Olympic sized swimming pools/yr of wastewater are produced along with 79 garbage trucks of solid waste. Finally, consider that 523 cars/yr worth of CO₂ emissions are created.³⁰

Considering the offset costs, mentioned previously, if the University pushed its mandate to include all students, the offset required would be over \$77,200 (or \$154,400 from the previous social calculation).

Paper Statistics MBA / UBC		
	MBA Program	UBC Students
Students	116	40,000
# of Sheets of Paper	1,320,350	227,100,200
Tons of Paper	6.6	1,138
Tons of CO ₂	17.9	3,088
Population Multiplier		345
Timing Reduction Factor (.5)		172
Offsets (\$25/ton)	\$448	\$77,210
Social Offsets (\$50/ton)	\$895	\$154,420
\$ Spent on Paper / Printing	\$13,204	\$2,271,002

Table 2 – UBC Student Paper Usage Estimates

Using an estimated printing cost of \$.01 per page, the students' cost for printed materials at UBC is approximately \$2,271,002. These costs could be theoretically avoided if a paperless campus existed. This also avoids the waste created by the 1,752 tons of waste paper that is archived, thrown away, resold or reused every year.

³⁰ Environmental Defense Fund – Paper calculator

Paperless MBA

The idea of a paperless MBA was originally a business plan idea. The printing costs were the only consideration and the theory was that students would be provided with readers, thus eliminating the need for most paper use. Quickly, as the topic was researched further, it was realized that environmental and practical factors needed to be considered. There are four main stakeholders to consider in the move towards the paperless MBA: university administration, faculty, students and publishers.

University Administration

The infrastructure is in place, benchmarks have been set and initiatives are occurring at the administrative / operations level. The mandates that have guided these offices to action now need to be passed on to faculties and students.

The first step to action is education and further research should be conducted into the topics covered in this paper. Top-down education will be critical to paper reduction on a campus wide basis. The education process will promote grass-root initiatives by students and perhaps faculty as to ways they can reduce their impact.

Professors / Faculty

Perhaps one of the most difficult changes will be swaying professors to adopt new technologies to facilitate the transition. Currently, there are frameworks and systems in place to deliver course materials online; however adoption rates are

lower than one would hope. A very simple piece of evidence to this matter is that students still fill out Scantron evaluations on teacher performance at the end of a course. This is not only a waste of paper but also an overall waste of resources, as time and labor need to be invested to enter, tabulate and report on the results. A paperless solution would provide instantaneous tabulation and feedback while eliminating waste paper and resources.

Aoki & Pogroszewski (1998) have proposed the following Steps to E-Learning:

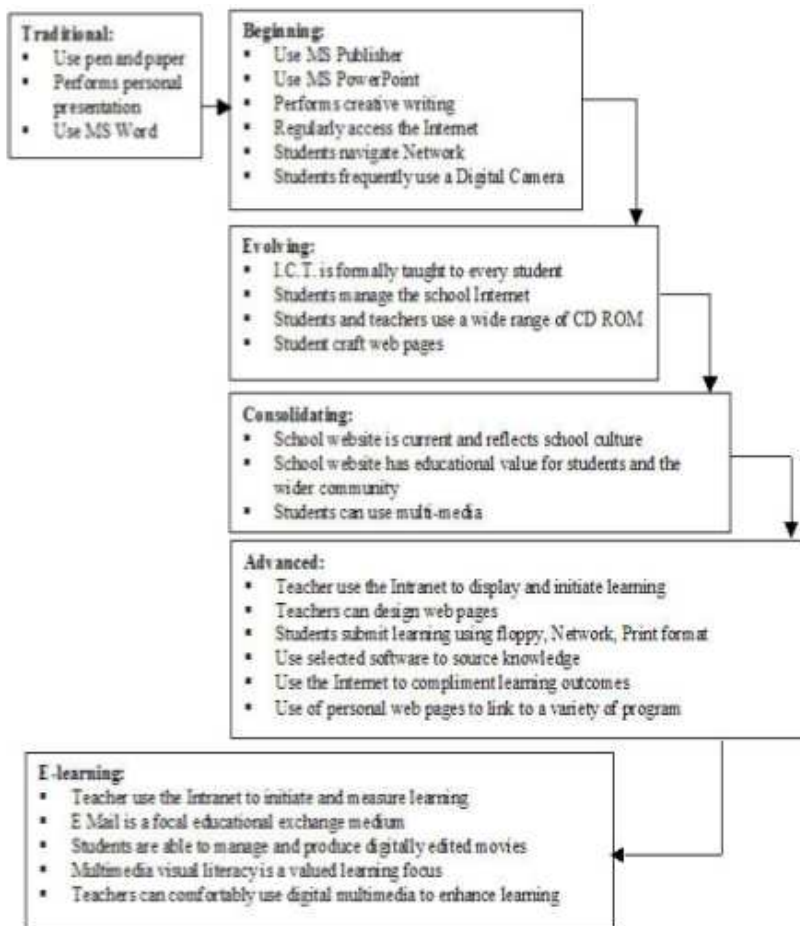


Figure 3 - Association for the Advancement of Computing In Education Journal, 15(3)

Although the framework is dated it provides a great benchmark. The Advanced and E-Learning concepts of 1998 are just now becoming a dominant component of school programs and there is still room for great change and improvement.

In order for faculties and professors to move forward with future initiatives, standardized infrastructure and systems needs to be built, training and awareness need to be mandated and their needs to be support systems to facilitate professors' transition. These changes will take place over time in correlation with university efforts to set goals and mandate solutions.

Students

Students by their own habitual nature, combined with a lack of access to materials, will continue to print and consume hard copy versions of school materials. The overall lack of awareness of University initiatives was apparent in the survey. 78% of students did not know about the BC Government and University mandates towards carbon neutrality. Additionally, 72% of students did not feel that the MBA program was employing sustainable practices. The top-down initiatives of the University have not connected with students. However, university policy is only one hurdle to overcoming the problem. Student habits and preferences also have to change.

The results of the survey reveal that 83% of the students currently prefer using hard copies of their textbooks and course packages, while a similar percentage of people prefer to read course slides off of their laptops. One of the main reasons that students are currently using hard copies for course packages is that most of them

are not made available online. The main reasons that students are reluctant to switch to online versions of textbooks currently is that most enjoy the ease of reading, portability, versatility, and annotating capability that paper offers over online alternatives.

If an e-textbook were to be offered at the same price as a hardcopy, only 17% of students stated that they would not be willing to make the change to online versions. 92% would use an on-line version if access were provided for free. For the group that was surveyed, most students expected to receive a discount of between 30-50% in order for them to willingly switch to e-textbooks.

Education, awareness and a mandated paradigm shift will be instrumental in moving towards a paperless program.

Publisher Problem

Another major hurdle to overcome is the publisher problem. Publishers will not move to online offerings if there is no financial incentive to move to e-books. Figure 4 explains the difference between the flow of funds in traditional methods and that of an on-line option.

In the traditional model, an author receives payment from a publisher. The publisher then markets the book to the professor and then provides hard copies to a university book store with a mark up. The bookstore then stocks, stores, sells and distributes the textbooks.

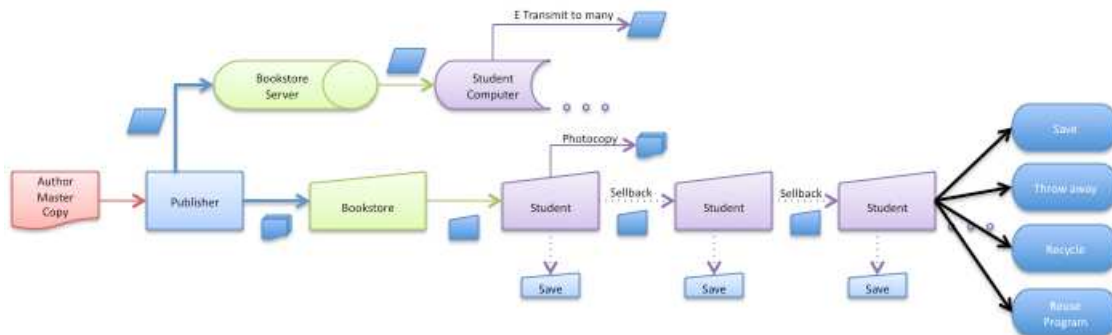


Figure 4 – Textbook v. Online flow chart

In an online version, a publisher would provide a digital copy to a university’s server. Students would then be able to download the electronic version to their chosen electronic device.

Debbie Harvey, Director of the UBC Bookstore reports that at maximum 25% of text books are resold. Usually, students sell the book back to the bookstore at a 50% discount and the text is resold at 75%. Reuse does not provide publishers with any additional revenue.

The average textbook addition has a lifespan of 3-4 years³¹. Assuming it is utilized for 2 semesters per year, the textbook has a maximum of 8 cycles. If you were to take the average MBA text across a student body of 116 students, given the 75% retention rate, a total of 928 textbooks uses would occur over the 4 year period. New textbook sales would be approximately 725 copies.

If we assumed an average textbook price of \$100, each edition of a textbook would result in \$72,500 to the Bookstore in revenue. If you were to look at the MBA class,

³¹ Debbie Harvey, Director of the UBC Bookstore

28 courses, 116 students, an average price of \$100, and 25% resold, the revenue that publisher's received from one MBA class would be over \$240,000.

This is essentially where the publisher problem begins. Referencing Fig. 4 publishers stand to jeopardize their revenue model if a book goes online. Student file sharing is much easier with an electronic copy. Photocopying a textbook does occur but it is not as easy, convenient and certainly costs more.

The fact of the matter is that publishers will not go online without a revenue model that will support them. The following models could be considered:

University Agreement – an agreement between publishers and the University could be struck that provides students with online access to the required textbooks for a fixed fee, based on program and course selection. This fee would be applied as a separate line to student's tuition commitment. The structure of the agreement could be similar to the current arrangements for journal access.

The benefit of this would be a complete 100% reduction in paper and the corresponding waste associated with retired textbook versions. Intellectual rights to the copies would all be paid for and publishers would still maintain their revenue stream. On the other hand students would likely objected to the mandatory fee and the elimination of hard copies could deem the traditional bookstore obsolete.

Professor Agreements – Publishers could work with professors to provide customized online content to students. Students would be required to pay for this access, thus offsetting the revenue lost by providing the book online.

Professors could stand to gain from this option. The customized online environment could provide professors with supplemental testing and learning tools.

A good example of this is www.MyFinanceLab.com a supplemental fee-based site provided by Pearson Publishing. The fees associated would be higher than the previous model as customization requires collaboration and additional costs. Additionally, there will likely be lower adoption, as this method does not meet the needs or demands of all courses.

These models will provide publishers with their revenue streams, and students will have easy access to all the textbooks they require. Unfortunately, to date, publishers have continued to price online textbooks at a price equivalent to hard copies. This is a very profitable move but also very restrictive.

Based on the current breakdown of cost and profit for the textbook industry, an online option could be feasible at a reduced cost.

\$ Distribution of the Textbook Industry		
	Print	E-Book
Paper, printing, editing	32.7	11.0
Profit To Author	11.6	11.6
Publishing General Admin	10.1	10.1
Publisher Marketing	15.5	15.5
Publisher Income After Tax	7.2	7.2
College Store Personnel	11.6	7.8
Freight	1	0.0
College Store Pre Tax Income	5.8	5.8
College Store Operations	4.5	3.0
	100	69.0

Source: National Association of College Stores 2008

Figure 5 - \$ Distribution on Textbooks

By moving online publishers would eliminate paper and printing costs. Additionally, bookstore personnel and operations would be reduced due to the decreased administrative and operational costs associated with textbooks. If there

was a total shift online, theoretically, bookstores textbook business would vanish thus reducing the costs associated with a text by a further 16%.

At this point the model would work for publishers who maintain their revenue. Students would pay a fee inline with the associated cost they expect to pay for an online book and the environmental impact of textbook production and retirement could be reduced substantially.

In order for any of these models to work, three major factors must change completely. The publishers and bookstores must develop a new revenue model that will require a 100% commitment on both parties. Secondary to this, students must be willing to make the change to on-line formats. If students are not going to buy the books in this format, the change will not occur. If students plan to print out these materials the attempted paperless environment will not exist. Furthermore, students will need to learn to adapt to viewing and manipulating text on their computers. The technology problem represents the third factor. Without accessible and flexible technology that will allow students to interact with texts in ways similar to traditional methods, they will not convert or will in fact print the materials. Further research and innovation is required in this area.

The Paperless Continuum

The move towards a paperless MBA will not happen overnight. Action must be taken to educate and build awareness of the issues. Considering the limited efforts that are occurring to date, from a faculty student perspective there is opportunity to move from the current state to a state of change quickly.

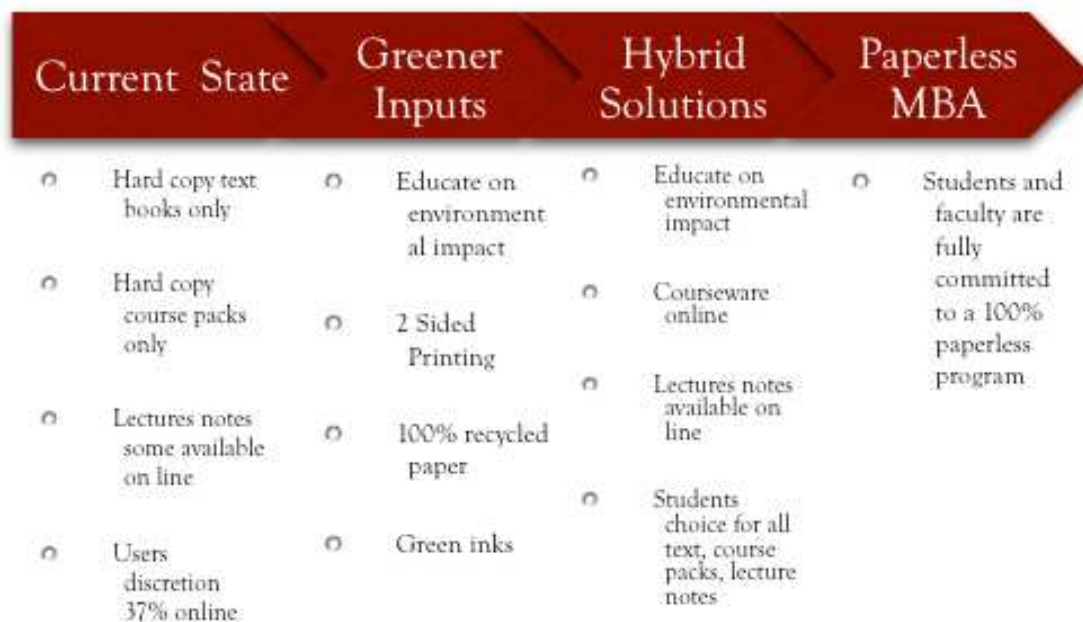


Figure 6 – The Paperless Continuum by Chris Forrest

Easy steps to make progress

University mandate

The University should take steps to ensure that cleaner and more sustainable practices are enforced. The University should continue to set benchmarks, targets and awareness programs to educate both staff and students. The student survey indicated that more than seventy eight percent of the students and staff were not aware that the University had made a pledge to be carbon neutral by 2010. Education and awareness are tantamount to getting complete buy-in from all interested parties, which will eventually lead to success.

Standardize protocols for faculty and administration

The faculty and staff should have a standardized way of interacting with the students and each other in order to facilitate the transition towards reduced paper usage. Setting out a protocol for how to post material to online sites such as Vista,

as well as providing details regarding the handing in of essays, exams, teacher reviews and assignments would enable UBC to start the process towards a reduction in paper. Once the professors understand how their actions directly affect the students' paper usage, they may be more willing to modify their ways. The standardization protocols will eliminate confusion and ensure that students and faculty have accurate expectations regarding each individual class. Should special circumstances arise, there can obviously be exceptions made, however this will vastly improve on the current disconnect between individual professor's expectations, which is evident within our business school.

Encourage the use of recycled paper, greener inks and post-consumer paper

This is one of the most practical solutions. The survey clearly indicates that students prefer hard copies over e-versions and expecting everyone to adopt to online technology will be difficult. People like to use paper so using recycled paper, greener inks, post-consumer paper and two-sided printing is an easy way to benefit the environment without affecting the students. Students can continue to use paper but use of recycled paper, greener inks and greener paper sources will reduce the use of virgin paper, which will in turn lead to a reduction of deforestation. Table 3 shows some of the environment impacts of different types of paper.

Table 3. Environmental Impacts of different types of paper

	Regular Copy Paper with 0% Recycled		Regular Copy Paper with 30% Recycled		Regular Paper with 80% Recycled		Difference 30% to 80% Recycled
	Quantity of paper consumed/person	Quantity of paper consumed by all students	Quantity of paper consumed/person	Quantity of paper consumed by all students	Quantity of paper consumed/person	Quantity of paper consumed by all students	
Paper Use (Tons)	0.09	6.6	0.09	6.6	0.09	6.6	
Paper Use In (Kgs)	90	6600	90	6600	90	6600	
Wood Use (Tons)	<1	23	<1ton	16	<1	5	
Total energy (BTUs)	3 million	253 million	3 million	220 million	2 million	165 million	1 Million
Greenhouse gases (Co2 Equiv) in Lbs	512	37555	455	33,381	360	26425	-20.88%
Waste water (Gallons)	1717	125,896	1,481	108,571	1087	79,695	-26.60%
Solid waste (Lbs)	205	15,037	175	12,812	124	9104	-29.14%

Source: Environmental Defence Fund - Paper Calculator

Use Economic models to solve the publisher problems:

The online versions of the books can easily be passed around to individual students free of charge and, in the process, the publisher loses out on profits. Because of this, publishers lack the incentive to publish their work online, making the shift towards green tough. A financial model has to be developed whereby both the student and the publisher benefits. This way the publisher would be happy to release online versions of the book for the right price. By putting up all the information online and by charging a reasonable price, the student will be willing to switch to online study practices.

Promote success internally and externally

People adapt to successful models. By publicizing all successes within UBC and elsewhere, both faculty and students will be able to see the tangible results that their efforts are creating. This will create a reinforcing effect where most people

will feel compelled to do more to further the cause. External promotion will create a buzz for the University, and may enable them to acquire further funding, better researchers, and higher quality students and faculty. They benefit from the free publicity that would be present should these metrics start to take effect.

Conclusion

A paperless solution can benefit all stakeholders. In addition to the material and process savings, students could receive textbooks and lower prices and professors could gain useful supplementary tools for their courses. By going online we can eliminate the massive graveyard of old texts, discarded notes and most associated environmental impacts. A paperless MBA could also offer³²:

Reduced footprint

Reduced Costs

Increased collaborative capabilities

Increased compliance with regulation

Increased Security


Achievable / Searchable materials for reference

³² Microsoft Small Business Center

Appendix 1 - Survey Results

A survey was conducted to assess MBA student's feelings and understanding of paper consumption. The survey was sent to 116 student and 37 responses were recorded. Although this information is not statistically significant, it is felt that it is directional in nature.

- Only 17% of the students preferred to read the text and lectures from their computer systems.
- The main attributes that prevents the students from switching to online methods were ease of use, portability, multi viewing; e.g keep the paper side by side and carry out analysis and highlighting/ editing the document.
- Around 92% of the students were willing to switch to online sources if the resources (i.e. electronic versions of both the text and the course package were available online.)
- More than 75% of the students were not aware that the university has mandated carbon neutrality by 2010.
- Students feedback (In appendix) clearly reveals their thoughts and suggestions towards moving towards a sustainable MBA
- Once students are educated about the impacts caused by them, around 80% of the students were willing to switch to sustainable methods e.g. greener ink, recycled paper, double sided printing.

1. Are you an MBA student			
Yes		38	100%
No		0	0%
Total		38	100%

2. Based on your current paper usage in the MBA program, what are your habits...					
Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Always printed	Mostly Printed	Half n Half	Mostly online	Always online
	Text Books	19 45%	17 40%	3 7%	3 7%
Course Package	20 49%	14 34%	4 10%	3 7%	0 0%
Class slides	6 15%	2 5%	8 20%	19 46%	6 15%
Rough notes	9 22%	11 27%	6 15%	8 20%	7 17%

3. For the options given below which one do you prefer

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Hard copy	Online Version
Text Books	33 85%	6 15%
Course Package	25 61%	16 39%
Class Slides	11 26%	31 74%
Rough notes	21 51%	20 49%

4. The price of the online version of the text, course package should reduce by ----- percent for me to switch to online.

10%		2	5%
20%		2	5%
30%		10	24%
40%		5	12%
50%		17	40%
Other, please specify View Responses		6	14%
Total		42	100%

5. If the online versions of the text books are given for free, would you switch to online

Yes		38	90%
No		4	10%
Total		42	100%

6. Please rate how important these attributes are for a text books and course packages

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Not Important	Somewhat important	Important	Very important
Portability	2 5%	10 24%	13 32%	16 39%
Ease of reading	1 2%	3 7%	3 7%	34 83%
Multi viewing(To keep the pages side by side and analyse)	4 10%	6 15%	14 34%	17 41%
Highlighting/Ease of editing	5 12%	4 10%	11 27%	21 51%

7. Impacts caused by an MBA student: Paper consumption : 90kgs Energy used to produce the paper : 3 million BTU Greenhouse gas emission: 455 Lbs
Water used to produce this paper :1481gallons Solid waste: 175 Pounds By switching to the solutions below you will save 1 million BTU in energy, reduce greenhouse gases by 95lbs , reduce water wastage by 394 gallons, reduce solid waste by 51 pounds Based on this information, how willing would you be to adopt the following solutions :

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Unwilling	Neutral	Willing
E- versions of text and course package	6 14%	13 31%	23 55%
Double sided printing	0 0%	4 10%	37 90%
Greener Ink	0 0%	5 12%	37 88%
100% Recycled paper	0 0%	5 12%	37 88%

8. Are you aware that the university is mandated to be carbon neutral by 2010?

Yes		11	26%
No		31	74%
Total		42	100%

9. Are you aware that the BC government is legislated to be carbon neutral by 2010

Yes		13	32%
No		28	68%
Total		41	100%

10. A substantial amount of your tuition is going towards the printing and carbon offsetting costs . Please comment

[View 29 Responses](#)

11. Suggest changes to make the MBA program more sustainable



[View 23 Responses](#)

12. Given the importance that UBC gives to sustainability and the Sauder school having a sustainability specialization , Do you find the school and the University to be using sustainable practices

Yes		8	21%
No		31	79%
Total		39	100%


13. If you find an MBA program that is carbon neutral and sustainable would you be willing to





Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Yes	No
Willing to pay more	9 22%	32 78%
Willing to choose that program over a better ranked program	11 27%	30 73%
Spread the word and encourage people to join	25 61%	16 39%

14. Do you think the carbon neutrality should be considered as a parameter in the Financial Times rating			
Yes		24	59%
No		17	41%
Total		41	100%

15. Please share your insights as to why you use the paper the way you do .

[View 25 Responses](#)

16. Sex			
Male		24	59%
Female		17	41%
Total		41	100%

17. Please indicate age range			
20-30		17	41%
30-40		22	54%
40-50		1	2%
50 and above		1	2%
Total		41	100%

Selected Survey Comments

10. A substantial amount of your tuition is going towards the printing and carbon offsetting costs . Please comment

Response

1 Shouldn't this be by choice?

2 We have no other choice, we have abused the environment enough already

3 ?

4 I didn't know that!

5 Profs should not be printing out hand-outs, Hernan was bad for that, copy centres and library printers should offer double-sided printing. What the hell are they spending that money on?

6 I'd prefer to get notes, course packs electronically. I throw them in the recycle bin at the end of each period.

7 Lets make the MBA more sustainable, save the environment and money

8 Waste of money on carbon offsetting if they can reduce printing costs

9 Not good.

10 Sweet

11 What does a substantial amount mean? I'd need to know the amount? How much is

going to offsetting?

12 Well, seems fucked up that the achievement of carbon neutrality comes at the expense of a double negative to my pocket book... F'n UBC.

13 that seems silly, why offset? why not print less and save

14 I think that's fair but I don't think students are aware of it otherwise they would do more to mitigate environmental impact more.

15 if my tuition would decrease due to using online materials, i would.

16 That's fine. Textbooks are still expensive

17 electronic versions are a lifestyle change. tough sell.

18 Seems like a leading question. How much is going to off-sets vs printing? It seems like we pay extra for the printing.

19 Tuition costs should be 100% allocated to education related funding. Taxation for carbon offsets should be broadly applied across the population.

Paper hard copies are totally unnecessary and not cost effective at all. Everything should be made available in an electronic format. Students can then make the decision of what they'd like to actually print.

One of the key steps in going carbon neutral is reducing emissions at the source prior to offsetting. I would very much like to hear what steps the school is taking to reduce its paper use (and resulting emissions).

22 This irritates me. We should be offered the choice of electronic cases, course notes etc. va. paper copies, which are a hassle to obtain from the Point Grey campus.

23 It does not seem to be invested effectively.

24 How do you define "substantial" 1%, 10%? 50%?

25 I believe this to be a false statement. Paper costs are less than 1 cent per page and are thus an insignificant portion of a \$40,000 tuition as are carbon offsets.

11. Suggest changes to make the MBA program more sustainable

Response

1 Less reading.

2 As an individual, spread the word about switching to on-line usage. I do it all the time!

3 Carpooling program; sharing readings to decrease printing costs/impacts on the environment

Intelligent heating and cooling systems, no print outs, more electronic information, utilization of vista by more profs, 100% recycled paper for course packages, motion detection lighting, LEED certification, organic and local food available at UBC food services outlets, grey water in bathrooms, waterless urinals, reduction in the use of chemicals in cleaning solvents, mandated shut down of professor and staff computers at night, organic cotton items available for sauder branded merchandise, travel mug

given to all MBA students, water bottles given to all MBA students, wave/tidal energy electricity generator in the ocean on UBC campus, mini-wind power generator and solar panel electricity powered buildings, bio-fuels and/or hybrid vehicles for all university cars and trucks

5 provide all reading packages online, and do not request hardcopy hand ins, allow computers for open book exams

6 No hardcopy submissions

7 Way less printing. Give us the choice if we want to print something by making it available online.

8 Online course packs, double sided printers in the libraries, assignments handed in printed on both sides or just use e-copies only,

Instructors should make it easy to not have to print their course notes to take notes, i.e.
9 put them online in a format that we can add to them, not as pdf files. Then we have to print them out to add notes. PPT slides are better.

10 use carbon neutral services or sustainable sources for its events like what net impact did.

11 Textbooks online so we print out only what we need!

12 package the e-versions so that they are not so temporal and can be downloaded easily. Profs do not appropriately title the downloads of class notes in a structured way

13 Have the teachers put everything on-line.

Textbooks are a scam. They are overpriced and new editions with negligible content updates are frequently issued to perpetuate sales. I believe that publishers are unwilling to move towards electronic formats because printed books are less conducive to
14 duplication. Some professors have done away with texts altogether by consolidating all course materials into class slides and online assignments (UBC Vista assessments). This approach should be encouraged.

Laptops should be made a mandatory requirement for the program. Most, if not all, students already have one so this shouldn't be a problem. The campus is already outfitted with wireless access so everyone so accessibility to these electronic
15 documents should not be a problem.

Also, all exams should be offered to be done in an electronic format where possible. Hand writing exams is totally unnecessary. We will never be expected to hand write a report out in the real world, so why do it for the program??

All course packages and lecture slides should be available in soft copies that can be
16 printed only if required by the students. We should not be made to purchase full textbooks when we will on by using a few chapters from it.

The program is very sustainable as it is. It is the students and their awareness of the
17 impact of their consumptive behaviours that creates added waste. The biggest impact this year I noticed was the travel that the Kelowna students had to incur to come to Vancouver each weekend, and the amount of coffee cups/takout containers that all the

students create each weekend. That however, is up to the students themselves to change, as ubc offers coffee on campus in ceramic mugs. Efforts to facilitate more classes to be offered by video would help.

Standardize the way profesors design their material for classes. No matter how hard you try and how fancy you call your practises, if you don't get profs to use the resources correctly it is worth nothing. UBC hrecently invested hundreds of thousands
18of dollars in the videoconferencing to broadcast our clases to Kelowna... profs keep writing on paper, nopt handing PPT copies of the slides before class, are not consistent in posting documentation on WEBCT or other on-line file sharing platform. Once you manage to change these practises, you will succeed implementing further changes.

You may need a new generation of students - I do not like reading online and thus,
19even if textbooks were electronic, would still print them to read defeating the environmental portion of the exercise.

Use of online books (in PDF or other similar format). Every prof to give digital version
20of their slides/presentations (sorry, that means you too Steve A!).Encourage students to take digital notes (most are already).

I like the idea of electronic textbooks, but there are still some issues with them. They cost almost as much and they expire after six months, typically. I have an eBook reader
21and I like it, but it doesn't operate the way people use textbooks (yet). Course packages, on the other hand, should always offer a digital option. Not only do they print them, but they have to courier them out to part time students frequently, increasing the impact and the cost.

22Add secure bicycle storage and lockers at MBA class locations such as Robson Square.

-part of orientation -encourage use of reusable coffee mugs/water bottles
-don't provide bottled water, just glasses
-improve recycling options. Robson Square has lots of recyling bins but it is not clear
23what is plastics/paper/container etc.
-add organics recycling
-reduce the number of tv screens at Robson Square -they suck tons of power
-encourage and facilitate use of more electronic submissions and documents.